

CLAIMS

1. A system providing low bit-rate compression of data comprising speech and music components for transmission, over a network, said system comprising:
  - a. a speech encoder encoding said speech component via a first encoding algorithm, transforming said encoded speech signal into a format suitable for transmission, and embedding synchronization information associated with said speech component;
  - b. a music encoder encoding said music component via a second encoding algorithm, said second encoding algorithm different from said first encoding algorithm; transforming said encoded music signal into a format suitable for transmission; and embedding synchronization information associated with said music component; and
  - c. a multiplexer multiplexing said outputs of said speech encoder and said music encoder for transmission over said network,  
wherein said first and second encoding algorithms are chosen to allow for low bit-rate compression of speech and music respectively.
2. A system as per claim 1, wherein said data is a composite of said speech and music components and said system further comprises a signal separator, said signal separator separating said speech and music components from said composite.
3. A system as per claim 1, wherein said data further comprises a text component, a video component, and a graphics component, said system further comprising:
  - a text formatter transforming said text component into a format suitable for transmission and embedding synchronization information associated with said text component;

5                    a video encoder encoding said video component via a third encoding algorithm, said third encoding algorithm different from said first and second encoding algorithms; transforming said encoded video signal into a format suitable for transmission; and embedding synchronization information associated with said video component;

10                  a graphics encoder encoding said graphics component via a fourth encoding algorithm, said fourth encoding algorithm different from said first, second, and third encoding algorithms; transforming said encoded graphics into a format suitable for transmission; and embedding synchronization information associated with said graphics component; and

15                  said multiplexer in (c) additionally multiplexing the output of said text formatter, said video encoder, and graphics encoder.

20                  4. A system as per claim 3, wherein said text component corresponds to subtitles associated with said video components.

25                  5. A system as per claim 1, wherein audio volumes associated with said speech component and said music component are modifiable relative to each other.

20                  6. A system as per claim 1, wherein said speech encoder is a LPC, MELP, CELP, or waveform interpolation encoder.

25                  7. A system as per claim 1, wherein said speech encoder is used in conjunction with a speech-to-text converter, and

                       said speech-to-text converter converting said speech component to a text component; and

said speech encoder encoding said text components and formatting said encoded text into a format suitable for transmission.

8. A system as per claim 1, wherein said embedded synchronization information is any of the following: timestamps, synchronization labels, media synchronization tags, synchronizing tokens, or wait-on-event commands.
9. A system as per claim 1, wherein said music encoder is a MIDI-encoder or linear musical score notation.
10. A system as per claim 1, wherein said music encoder is a transform-based encoder.
11. A system as per claim 1, wherein said network is any of the following: local area network, wide area network, the Internet, cellular network, storage network, or wireless network.
12. A system providing low bit-rate compression of audio comprising speech and music components for transmission over a communication channel, said system comprising:
  - a. a first analog-to-digital converter converting said speech component into a digital speech signal;
  - b. a speech encoder encoding said digital speech signal via a first encoding algorithm;
  - c. a speech audio formatter transforming said encoded speech signal into a format suitable for transmission and embedding synchronization information associated with said speech component;

- d. a second analog-to-digital converter converting said music component into a digital music signal;
- e. a music encoder encoding said digital music signal via a second encoding algorithm, said second encoding algorithm different from said first encoding algorithm;
- f. a music audio formatter transforming said encoded music signal into a format suitable for transmission and embedding synchronization information associated with said music component; and
- g. a multiplexer multiplexing said outputs of said speech audio formatter and said music audio formatter for transmission over said channel.

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- 13. A system as per claim 12, wherein said speech encoder is a LPC, MELP, CELP or waveform interpolation encoder.

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- 14. A system as per claim 12, wherein said music encoder is a MIDI-encoder or linear musical score notation.

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- 15. A system as per claim 12, wherein said embedded synchronization information is any of the following: timestamps, synchronization labels, media synchronization tags, synchronizing tokens, or wait-on-event commands.

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- 16. A system as per claim 12, wherein said music encoder is a transform-based encoder.
- 17. A method to encode audio for transmission over a communication channel, said audio comprising speech and music components, said method comprising:
  - a. converting said speech component into a digital speech signal;

- b. encoding said digital speech signal via a first encoding algorithm;
- c. transforming said encoded speech signal into a format suitable for transmission and embedding synchronization information associated with said speech component;
- 5 d. converting said music component into a digital music signal;
- e. encoding said digital music signal via a second encoding algorithm, said second encoding algorithm different from said first encoding algorithm;
- f. transforming said encoded music signal into a format suitable for transmission and embedding synchronization information associated with said music component; and
- 10 g. multiplexing said outputs of steps (c) and (f) for transmission over said channel.

15 18. A method as per claim 17, wherein said embedded synchronization information is any of the following: timestamps, synchronization labels, media synchronization tags, synchronizing tokens, or wait-on-event commands.

20 19. An article of manufacture comprising a computer usable medium having computer readable program code embodied therein for decoding transmitted data received over a communication channel, said transmitted data comprising a plurality of components, each component encoded via a separate encoding algorithm to provide low bit-rate compression, said medium comprising:

- 25 a. computer readable program code aiding in receiving said transmitted data received over said communication channel;
- b. computer readable program code de-multiplexing said data into a plurality of components, said components comprising at least a speech component and a music component;

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- c. computer readable program code decoding said speech component via a first decoding algorithm; and
- d. computer readable program code decoding said music component via a second decoding algorithm, said second decoding algorithm different from said first decoding algorithm.

10 20. An article of manufacture as per claim 19, wherein said plurality of components additionally comprises a video component, a text component, and a graphics component, said medium further comprising:

- a. in addition to de-multiplexing said data into speech and music component, computer readable program code de-multiplexing said video component, said text component, and said graphics component
- b. computer readable program code formatting said text component;
- c. computer readable program code decoding said video component via a third decoding algorithm, said third decoding algorithm different from said first and second decoding algorithm; and
- d. computer readable program code decoding said graphics component via a fourth decoding algorithm, said fourth decoding algorithm different from said first, second, and third decoding algorithm.

20 21. A method encoding data for transmission over a communication network, said data comprising speech, music, video, text, and graphic components, said method comprising the steps of:

- a. encoding said speech component via a first encoding algorithm;
- b. transforming said encoded speech signal into a format suitable for transmission and embedding synchronization information associated with said speech component;

- c. encoding said music component via a second encoding algorithm, said second encoding algorithm different from said first encoding algorithm;
- d. transforming said encoded music signal into a format suitable for transmission; and embedding synchronization information associated with said music component;
- e. encoding said video component via a third encoding algorithm, said third encoding algorithm different from said first and second encoding algorithms;
- f. transforming said encoded video signal into a format suitable for transmission and embedding synchronization information associated with said video component;
- g. transforming a text component into a format suitable for transmission and embedding synchronization information associated with said text component;
- h. encoding said graphics component via a fourth encoding algorithm, said fourth encoding algorithm different from said first, second, and third encoding algorithm;
- i. transforming said encoded graphics signal into a format suitable for transmission; and embedding synchronization information associated with said graphics component; and
- j. multiplexing said outputs of steps (b), (d), (f), (g), and (i) for transmission over said network,  
wherein said first, second, third, and fourth encoding algorithms are chosen to allow for low bit-rate compression of speech, music, video, text, and graphics respectively.

22. A method as per claim 21, wherein said embedded synchronization information is any of the following: timestamps, synchronization labels, media synchronization tags, synchronizing tokens, or wait-on-event commands.
- 5 23. A method as per claim 21, wherein said network is any of the following: local area network, wide area network, the Internet, cellular network, storage area network, or wireless network.